

Seminar on Condensed Matter Theory

Group of Theoretical Physics at the Department of Condensed Matter Physics
of Charles University has a pleasure to invite you to attend the seminar

on 25 September 2018 at 14:00

at Faculty of Mathematics and Physics of Charles University, Ke Karlovu 5, 121 16 Praha 2
seminar room F052



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On the quantum phase transition in the superconducting quantum dot system

working version

Single-level Anderson quantum dot attached to BCS superconducting leads exhibits a $0 - \pi$ impurity quantum phase transition, which can be experimentally controlled either by the gate voltage or by the superconducting phase difference. We present two simple analytical formulae describing the position of the phase boundary in parameter space for the weakly correlated and Kondo regime, respectively. Furthermore, we show that the two-level approximation provides an excellent description of the low-temperature physics of superconducting quantum dots near the phase transition. We discuss reliability and mutual agreement of available finite temperature numerical methods (Numerical Renormalization Group and Quantum Monte Carlo) and suggest a novel approach for determination of the quantum phase boundary from measured finite temperature data.

